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2,4,5-Trichlorophenoxyacetic Acid/Silvex Position Document 4

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This Position Document addresses the risks and benefits of pesticide products containing the subject active ingredient. The Agency has determined that the use of products containing the subject active ingredient may meet or exceed a risk criterion described in 40 CFR Part 154. Potential hazards will be examined further to determine the nature and extent of the risk, and considering the benefits of the subject active ingredient, whether such risks cause unreasonable adverse effects on the environment.

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2,4,5-T/Silvex Position Document 4

United States Environmental Protection Agency

Section Head: Kyle Barbehenn

POSITION DOCUMENT 4 FOR CERTAIN USES OF 2,4,5-Trichlorophenoxyacetic Acid (2,4,5-T) and 2-(2,4,5-Trichlorophenoxy) Propionic Acid (Silvex)

This document represents the conclusion of the Rebuttable Presumption Against Registration (RPAR) process for 2,4,5-T and silvex, and contains the Agency's final determination on regulatory action regarding the uses of 2,4,5-T and silvex which were not suspended on February 28, 1979. In summary, the Agency has reviewed the comments received on its decision, principally those of the FIFRA Scientific Advisory Panel (SAP) and the United States Department of Agriculture (USDA), and now reaffirms its preliminary decision to hold FIFRA 6(b)(2) hearings to determine whether or not to cancel these uses of 2,4,5-T and silvex.

I. Background

On April 11, 1978, the Environmental Protection Agency ("the Agency") issued a notice of rebuttable presumption against registration and continued registration of all pesticide products containing the herbicide 2,4,5-trichlorophenoxyacetic acid (2,4,5-T) [43 FR 17116, April 21, 1978]. Issuance of the RPAR began the Agency's public review of the registered uses of 2,4,5-T and the uses for which applications for registration are pending. Later,

on February 28, 1979, the Administrator ordered the emergency suspension of the use of 2,4,5-T on forests, rights-of-way, and pastures (suspended uses) [44 FR 15874, March 15, 1979].[1/] The RPAR review continued for the use of 2,4,5-T on rice, range,[2/] and certain non-crop sites (non-suspended uses).

When the suspension orders were issued, silvex was a candidate for RPAR review, but an RPAR notice had not been issued. However, the use of silvex on forests, rights-of-way, pastures, homes and gardens, aquatic areas/ditch banks, and commercial/ornamental turf was included in the suspension orders [44 FR 15897, March 15, 1979] because both 2,4,5-T and silvex contain the highly toxic contaminant 2,3,7,8-tetrachlorodibenzo-p-dioxin (TCDD), both have

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1/ Data and analyses developed in connection with the RPAR review led the Administrator to issue the emergency suspension orders and related notices of intent to cancel the suspended uses of 2,4,5-T and silvex. Suspension hearings began on April 19, 1979, but were discontinued on May 15, 1979, after all registrants withdrew from the hearings and petitioned the Administrator for an expedited cancellation hearing. The formal evidentiary phase of the cancellation hearing is scheduled to begin on January 22, 1980.

2/ See Appendix A, for a clarification of the definition of pasture (suspended use) and rangeland (non-suspended use).

comparable uses and correspondingly comparable exposure potential, and both pose risks of adverse effects which are similar in many ways.

The RPAR review of 2,4,5-T and the suspension action prompted the Agency to expedite its RPAR review of the uses of silvex which had not been suspended, namely the use on rangeland, rice, sugarcane, orchards, and non-crop areas[3/] (non-suspended uses). As a result of this expedited review, the Agency determined that the non-suspended uses of silvex exceed both the oncogenic and other chronic or delayed toxic effects risk criteria for issuance of an RPAR [40 CFR 162.11(a)(3)].

On July 9, 1979, the Agency issued preliminary notices of determination relating to the non-suspended uses of 2,4,5-T and silvex (44 FR 41531; 44 FR 41536, July 17, 1979). The Agency considered risk information concerning the non-suspended uses of 2,4,5-T and silvex and found (1) that 2,4,5-T and silvex are fetotoxic and teratogenic and (2) that 2,3,7,8 tetrachlorodibenzo-p-dioxin (TCDD), the trace contaminant in 2,4,5-T and silvex, is fetotoxic, teratogenic and carcinogenic. The Agency acknowledged that

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3/ See Table 1.

Table 1. Suspended and Non-Suspended Uses of 2,4,5-T and Silvex

	2,4,5-T	Silvex
Non-suspended uses [2,4,5-T RPAR issued April 21, 1978 (43 FR 17116); silvex RPAR issued July 17, 1979 (44 FR 41536)]	rice	rice
	range	range
	non-crop sites*	non-crop sites*
		sugarcane
		orchards
Suspended uses [2,4,5-T emergency suspension issued March 15, 1979 (44 FR 15874); silvex emergency suspension issued March 15, 1979 (44 FR 15897)]	forests	forests
	rights-of-way	rights-of-way
	pasture	pasture
		home and garden
		aquatic areas/ditch banks
		commercial/ornamental turf

* Includes use on or around non-crop sites, such as fencerows, hedgerows, fences (not otherwise included in suspended uses, e.g., rights-of-way, pasture); industrial sites or buildings (not otherwise included in suspended uses, e.g., rights-of-way, commercial/ornamental turf); storage areas, waste areas, vacant lots, parking areas, and all other non-crop sites.

there are some uncertainties about the amount of human exposure to 2,4,5-T, silvex, and TCDD because of the limited exposure information available.

Concerning the non-suspended uses of 2,4,5-T and silvex,the Agency has also considered economic benefits information which pesticide registrants, the United States Department of Agriculture, and other interested parties originally submitted in response to the 2,4,5-T RPAR notice. During the course of the review, the Agency weighed risks and benefits to determine whether or not the risks of each

use were exceeded by the corresponding benefits. The Agency determined that additional benefits data were being developed which merit consideration, especially for the non-suspended uses of silvex.

Accordingly, with respect to the non-suspended uses of 2,4,5-T and silvex, the Agency has concluded: (1) that continued use of these two chemicals appears to cause unreasonable adverse effects on the environment, (2) that there are uncertainties in the data relating to the risks and benefits of the uses at issue, (3) that additional data on the risks and benefits of the non-suspended uses of 2,4,5-T and silvex will permit the Agency to determine whether or not to cancel the registrations for these uses, and (4) that such information can be acquired through a public hearing under Section 6(b)(2) of the Federal Insecticide, Fungicide and Rodenticide Act, as amended, 7 U.S.C. Section 136 et seq. (FIFRA).

Under FIFRA, the Agency is required to submit these preliminary determinations to the Scientific Advisory Panel for comment on risk issues, and to the United States Department of Agriculture for comment on benefits issues. The Agency must then respond publicly to the comments made by the SAP and the USDA before making a final regulatory decision (7 U.S.C. 136d). The remainder of this document

sets forth the Agency's analysis of comments submitted by USDA, the SAP, and other interested parties, and the Agency's reasons and the factual base for the action it is taking. The formal comments submitted by the SAP and the USDA are reproduced in their entirety as Appendices B and C of this document.

II. Issues Relating to Risk

A. Comments Relating to Toxicity

The Agency's proposed action is based in part on data that show 2,4,5-T, silvex, and/or TCDD produce fetotoxic, teratogenic, and carcinogenic effects in test animals. The SAP agreed with the Agency's assessment of the toxic effects of these chemicals but did not fully agree on all aspects of its interpretation of dose level responses.

1) Reproductive Toxicity

In previous position and suspension documents, the Agency cited numerous studies in test species which showed that 2,4,5-T or silvex containing 0.5 parts per million (ppm) or less TCDD and pesticide-free TCDD produce cleft palate, kidney abnormalities, delayed ossification, fetal mortality, and reduced fetal weight (see 43 FR 17116, April 21, 1978 and 44 FR 15874, March 15, 1979 for review). In rodents, adverse effects were noted at maternal doses as low

as 10 milligrams per kilogram (mg/kg) body weight 2,4,5-T (0.05 ppb TCDD) [Smith, 1978]; 50 mg/kg silvex body weight (<0.05 ppm TCDD) [Dow, 1973]; and 0.001 micrograms per kilogram (ug/kg) body weight TCDD (Murray, 1979; Smith et al., 1976). Furthermore, in non-human primates, maternal doses of TCDD as low as 50 parts per trillion (ppt) [about 0.002 ug/kg] resulted in reduced fertility and increased fetal loss (Schantz et al., 1979). Similar and more severe effects have been observed at higher doses in all species tested. Because statistically significant effects consistent with those seen at higher doses were observed at 0.001 ug/kg TCDD in a three generation study in rats, and because this is the lowest dose tested in any species, the Agency has determined that a no-observed effect level (NOEL) has not been demonstrated for fetotoxic effects due to TCDD exposure.

The SAP agreed with the Agency that 2,4,5-T, silvex, and TCDD are each teratogenic and fetotoxic. The SAP also agreed that a NOEL had not been established for TCDD in monkeys. However, the SAP concluded that "for all practical purposes" a NOEL has been shown for TCDD in studies with rats and mice. Although the SAP concluded that 0.001 ug/kg was a practical NOEL, the Panel also recognized the existence of effects at this dose level. While the Agency interpreted these effects as significant, and sufficient to preclude

establishment of a NOEL, the Panel interpreted them as suggestive of a NOEL.

Without additional data, the Agency is reluctant to adopt the Panel's interpretation. TCDD is one of the most toxic chemicals known. Its degree of toxicity, as well as its toxic manifestations, varies among the animal species, and its effects on the human reproductive system are largely unknown. In addition, the control data upon which the study is based are so variable as to warrant concern that these fluctuations may be masking additional effects. Because the effects seen at 0.001 ug/kg are consistent with those seen at higher doses, and because of the factors listed above, the Agency is unwilling to dismiss the effects observed at 0.001 ug/kg as insignificant to risk assessment. Extrapolations from experimental animal studies to man are difficult even when there is a clear NOEL. When, with TCDD, there is no NOEL, the Agency would prefer to err on the side of safety.

2) Oncogenicity

In Position Document 2/3 on 2,4,5-T and Position Document 1/2/3 on silvex, the Agency concluded that commercial 2,4,5-T and silvex may pose a significant carcinogenic risk to exposed humans. This conclusion was based primarily on data

showing that TCDD, an unavoidable contaminant in commercial 2,4,5-T and silvex, is carcinogenic in laboratory animals.

The principal comments made by the SAP regarding the oncogenicity of 2,4,5-T, silvex, and TCDD, together with the Agency's response to these comments, are summarized below.

The SAP agreed with the Agency that TCDD is carcinogenic in laboratory animals. The SAP also agreed that commercial 2,4,5-T products pose some oncogenic risk to man because of contamination of these products with TCDD. However, the SAP concluded that the available evidence indicates that there is no substantial oncogenic risk to man from exposure to commercial 2,4,5-T.

The Agency disagrees with this conclusion. When the SAP considered the Agency's proposed Section 6(b)(2) notices for 2,4,5-T and silvex, the Agency had not yet completed its exposure analysis. The exposure information provided to the SAP was thus not a sufficient basis for making an accurate determination on whether or not the oncogenic risk posed by the uses of 2,4,5-T affected by the proposed notices was substantial. An accurate determination may be possible when the Agency completes its exposure analysis.

The SAP stated that the CAG concluded that the non-oncogenic dose [in the study by Kociba et. al. (1978) on TCDD] lies between 0.01 and 0.001 mg/kg/day. The Agency, however, contends that the CAG concluded only that no oncogenic response was observed in the Kociba study at a dose of 0.001 mg/kg/day. On the basis of the no-threshold dose response theory regarding carcinogenicity (Albert et al., 1977), the CAG and the Agency consider any dose of TCDD, no matter how small, to pose some carcinogenic risk to humans.

The SAP concluded that the few oncogenicity studies on silvex which have been conducted do not indicate any oncogenic effects, but commented nonetheless that "these data must be viewed with some caution becaue of the contamination of commercial silvex with TCDD."

The Agency agrees with the SAP that any chronic studies on silvex which have not demonstrated a carcinogenic response should be viewed with caution. Because TCDD is an unavoidable contaminant of commercial silvex, the Agency concludes that silvex poses some carcinogenic risk to exposed humans. A determination of the substantiability of this risk may be possible when the Agency completes its exposure analysis.

Certain other comments by the SAP reflect differences of opinion among scientists concerning other technical details which have no direct bearing on the Agency's proposal to hold a 6(b)(2) hearing. Such a hearing provides an appropriate forum for an in-depth development and analysis of the issues and the Agency thus feels that it is not necessary to respond to several of the SAP's comments on oncogenicity at this time.

B. Comments Relating to Exposure and Risks

On the question of potential human exposure to 2,4,5-T, silvex, and/or TCDD from the non-suspended uses, the Agency and the SAP are in agreement on the need for additional data. In reaching a preliminary decision, the Agency concluded that although the non-suspended uses appear to cause unreasonable risks of adverse effects, at

present, gaps in the data preclude an accurate assessment of the potential for human hazards. In particular, the Agency specified a need for additional information on possible avenues of human exposure. The SAP also concluded that there is a potential for human exposure from the non-suspended uses, but that the available data are "incomplete and preliminary in nature". The SAP specifically recommended that additional monitoring data be obtained from sources likely to demonstrate human exposure, placing particular emphasis on TCDD levels.

1) Monitoring Data

In the 2,4,5-T Position Document 2/3 and the Silvex Position Document 1/2/3, the Agency presented data from STORET, a computerized data base of surface water chemical residues, and from the National Surface Water Monitoring Program for Pesticides (NSWMPP), which indicate that 2,4,5-T and silvex residues were present in water in areas where these herbicides are used. The Agency acknowledged that these residues could not be attributed to specific uses of 2,4,5-T and silvex. However, the Agency's concern about these residues in the environment was supported by monitoring studies in rangeland (Marigold and Schulze, 1969; Lawson, 1976) and apple orchard areas (Cochran et al., 1976).

Concern about potential human exposure to 2,4,5-T, silvex, and/or TCDD from the non-suspended uses has prompted the Agency to undertake new monitoring studies. As indicated in the 2,4,5-T Position Document 2/3 and the Silvex Position Document 1/2/3, rice, crayfish, catfish, water, and sediment from the South are being tested to determine the extent of environmental contamination due to 2,4,5-T and silvex use on rice. The Agency is also engaged in monitoring edible fish, rice, sediment, human milk, beef fat, and beef liver for TCDD residues.

During the SAP meeting of August 15, 1979, the Agency acknowledged that there is not a large body of monitoring data available for specific uses because previously reported monitoring projects were rarely use-oriented and were frequently conducted at times when the chemical was not being used in the monitored area. Therefore, residues traceable to a particular chemical use might not be detected under these circumstances.

The SAP concurred with the Agency's view that available monitoring data are inadequate to assess potential human exposure from the uses of 2,4,5-T on rice, range, and certain non-crop sites, and from the use of silvex on orchards, rice, range, sugarcane, and certain non-crop sites. The SAP characterized the monitoring data presented

by the Agency as incomplete and preliminary in nature and recommended that additional data be gathered regarding the levels of 2,4,5-T, silvex, and TCDD in milk, tissues of range animals, and edible aquatic organisms.

As indicated above, the Agency is currently conducting several significant monitoring studies in the media recommended by the SAP. In addition, the Agency is reviewing recent monitoring studies by other researchers, such as another TCDD study in human milk (Memo, 1979c) and a TCDD study in fish (Kuehl et al., 1979). The results of these studies will be reviewed during the 6(b)(2) hearings.

2) Risk Comments

The SAP made several comments on the issues of exposure and risk, and on the methods of risk reduction with which the Agency disagrees. The Panel concluded that the margins of safety between exposure and the NOEL were sufficient to protect the general population from any reproductive risk associated with the non-suspended uses of 2,4,5-T and silvex. Concerning mixers and loaders, the SAP suggested that risk could be reduced to a safe level by the use of protective clothing and equipment. The Agency's disagreement with the Panel's adoption of a "for all practical purposes" NOEL for TCDD has been discussed above. The Agency further questions whether the existing data are

sufficient to permit the Panel's conclusion that protective clothing and equipment are sufficient to adequately reduce risk for mixers and loaders.

In addition, the SAP recommended that efforts be made to reduce the TCDD content in commercial 2,4,5-T and silvex. Although the Agency applauds any efforts by registrants to reduce TCDD levels in pesticide products containing 2,4,5-T and silvex, any review of these chemicals at this time can be based only on the present formulations of 2,4,5-T and silvex products which unavoidably contain TCDD. As for all other pesticides, 2,4,5-T and silvex registrants must provide the Agency with scientific data, through the registration process, that the production of 2,4,5-T and/or silvex without TCDD does not cause unreasonable adverse effects to human health or the environment.

C. Comment Relating to New Data

In addition to its comments on the Agency's assessment of existing data, the Panel urged the Agency to review new data from several on-going and recently completed studies. Specifically, the SAP recommended that a full set of details be obtained and evaluated concerning new oncogenicity studies conducted by Leuschner et al. (1979) with 2,4,5-T containing less than 0.05 ppm TCDD and by the National

Cancer Institute [NCI] (1979) with TCDD. Also, the SAP recommended similar measures for Dr. James Allen's on-going reproductive toxicity study in monkeys fed a diet containing 25 ppt TCDD (Allen, 1979).

This recommendation is fully consistent with the Agency's customary practice of evaluating new information as part of its continuing review of risks and benefits of registered chemicals. The Agency will review and assess these and any other available studies in the context of the proposed 6(b)(2) hearings.

In conclusion, the Agency has determined that the SAP comments do not warrant a change in the Agency's risk analysis for the non-suspended uses of 2,4,5-T and silvex at this time.

III. Issues Relating to Benefits

In the 2,4,5-T Position Document 2/3 and the Silvex Position Document 1/2/3, the Agency provided a preliminary benefits analysis and acknowledged that further review of the chemical alternatives was necessary before the Agency could make a final assessment of the risks and benefits associated with the continued uses of 2,4,5-T and silvex. Throughout the review of 2,4,5-T and silvex, the Agency has expressed concern about the quality and completeness

of much of the data it has obtained on the economic benefits of 2,4,5-T and silvex.

In its response to the Agency's proposal, USDA agreed that these data gaps can best be addressed through a 6(b)(2) hearing for the non-suspended uses of 2,4,5-T and silvex. USDA did not provide substantive comment on the benefits determinations which were presented in the Position Documents. In addition, USDA stated its intention to continue assembling additional data to be submitted to the Agency on the uses of, and benefits associated with, these herbicides. The Agency is also continuing to gather benefits information from other sources.

In conclusion, the USDA's comments on the Agency's preliminary benefits analysis for the non-suspended uses of 2,4,5-T and silvex wholly support the Agency's determination that further review is necessary and can best be addressed through a 6(b)(2) hearing.

IV. Conclusion

The SAP's assessment of the scientific data on the reproductive and the oncogenic effects of 2,4,5-T, silvex, TCDD in test animals is generally consistent with the Agency's position. Also, consistent with the Agency's

current efforts were several SAP recommendations for obtaining additional data.

The Panel concluded that it had found no evidence of an "immediate or substantial hazard" to human health or the environment associated with the non-suspended uses, and is likewise the Agency's position. Upon finding evidence of an "imminent hazard", the Agency acts to suspend the pesticide uses which are implicated. An example of such action is the recent emergency action suspending certain uses of 2,4,5-T and silvex.

As was discussed in the 2,4,5-T Position Document 2/3 and the Silvex Position Document 1/2/3 for the non-suspended uses, the Agency recommends holding a hearing, in part because the available data indicates that these uses appear to have unreasonable adverse effects on the environment. However, the Agency did not act to suspend these uses as it would have done if it had found an imminent hazard.

The SAP disagreed with the Agency's proposal to hold a hearing and recommended that the Agency not hold a 6(b)(2) hearing at this time. The Agency has taken the Panel's recommendations into account but has decided that such a hearing is appropriate, based on (1) information showing that the non-suspended uses of 2,4,5-T and silvex appear to

cause unreasonable adverse effects on man or the environment, (2) the Agency's and the SAP's conclusion that more information is necessary to resolve the issues involved, and (3) that a combined hearing is the most efficient and effective way to resolve the issues.

The Agency holds that it is in the public interest to combine the hearing for the nonsuspended uses with the cancellation hearing for those uses that were suspended on February 28, 1979. Not only will this action be administratively convenient for the Agency, registrants, and interested parties, entailing more efficient use of resources, but it will also ensure that the Agency's concerns on all uses of 2,4,5-T and silvex are addressed consistently.

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APPENDIX A

In response to comments expressing confusion about the Agency's pasture and range definitions, the Agency is taking this opportunity to correct an inadvertant error in the pasture definition and to modify the range definition.

In the pasture definition the word "and" was inserted in the list of cultural practices in place of the intended word "or" (44 FR 15874; 44 FR 15897, March 15, 1979). Therefore, the definition should be corrected by the substituting the word "or" for "and" so that the definition now reads as follows:

> Pasture is defined as land producing forage for animal consumption, harvested by grazing, which has annual or more frequent cultivation, seeding, fertilization, irrigation, pesticide application or other similar practices applied to it. Fencerows enclosing pastures are included as part of the pasture.

This correction clearly specifies that annual application of any one or more of these cultural practices will classify the land as pasture.

The following modification of the range definition will further explain the distinction between range and pasture. These modifications are based on the same USDA Forest Service material which was the source for EPA's

definition of pasture and range. With these modifications, range is now defined as follows:

> Range is non-pasture grazing land producing forage from native plant species or introduced species managed as native species. Grazing land which has annual or more frequent cultivation, seeding, fertilization, irrigation, pesticide application, or other similar practices applied to it is excluded. However, forests[1/], as defined in 44 FR 15893, March 15, 1979, are excluded.

1/ Lands capable of growing 20 cubic feet of wood per acre per year of desirable species which are not withdrawn for non-timber purposes.

Appendix B

FEDERAL INSECTICIDE, FUNGICIDE, AND RODENTICIDE ACT(FIFRA)

SCIENTIFIC ADVISORY PANEL

Review of Notices of Intent to Hold FIFRA Section 6(b)(2) Hearing on 2,4,5-T and Silvex

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The Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) Scientific Advisory Panel has completed review of the Notices of Intent by the Environmental Protection Agency (EPA) to hold hearings under the provisions of FIFRA Section 6(b)(2) to consider appropriate regulatory action for those uses of 2,4,5-T and silvex which were not included in the recent suspension orders. The review was completed in open meetings held in Arlington, Virginia, during the periods August 15-16, 1979, and September 20, 1979.

Maximum public participation was encouraged by the Scientific Advisory Panel to ensure an objective and adequate consideration of all relevant scientific issues relating to health and the environment. Public notice of the meetings was published in the Federal Register on July 27, 1979, and September 4, 1979. In addition, telephonic calls and special mailings were also sent to the general public who had previously expressed an interest in activities of the Panel.

Written statements relative to 2,4,5-T and silvex were received from Dow Chemical Company, and Michigan State University.

In addition, oral comments were received from Dr. J. R. Allen, University of Wisconsin Medical School; EPA technical staff; representatives of the Texas State Department of Agriculture; Dow Chemical Company; and the Environmental Defense Fund.

The FIFRA Scientific Advisory Panel wishes to recognize the excellent cooperation and assistance of numerous EPA technical staff throughout the review of 2,4,5-T and silvex.

In consideration of all matters brought out during the meeting and careful review of all documents submitted by the Agency and other parties, the Panel unanimously submits the following report:

In response to the Agency's request for advice concerning whether a FIFRA Section 6(b)(2) hearing should be held to resolve questions relative to the continued use of 2,4,5-T and Silvex on rice, rangeland, orchards, sugar cane, and certain non-crop sites, (1) the Scientific Advisory Panel recommends that the Agency not hold such a meeting at this time. After extensive review of the data we find no evidence of an immediate or substantial hazard to human health or to the environment associated with the use of 2,4,5-T or Silvex on rice, rangeland, orchards, sugar cane, and the non-crop uses specified in the decision documents.

The Scientific Advisory Panel has extensively reviewed the animal toxicity test data base for teratogenesis, carcinogenesis, and reproductive effects for 2,4,5-T, Silvex, and TCDD and has identified some additional data needs which should be addressed prior to final decision making relative to the safety evaluation of 2,4,5-T and Silvex. (2) The Scientific Advisory Panel recommends specifically that the full details be obtained and evaluated for the following three studies which were discussed briefly at the hearing:

1. The oncogenicity study on commercial 2,4,5-T being conducted in Germany in the Laboratorium Fur Pharmakologie Und Toxikologie. An oncogenic study has recently been completed on 2,4,5-T which was specially purified to contain a low concentration of TCDD. However, data is needed on the oncogenicity of commercial 2,4,5-T containing TCDD ($\leq$ 0.05 ppm).

2. The oncogenicity study recently completed at NCI with TCDD in both rats and mice; and

3. The reproductive toxicity study being conducted at the University of Wisconsin by Dr. Allen in which monkeys are being fed a diet containing TCDD at 25 ppt.

The Scientific Advisory Panel has also reviewed the available data regarding potential human exposure to 2,4,5-T and Silvex from use on rice, rangeland, orchards, sugar cane, and other non-crop applications and the monitoring data related to these uses and would characterize these as incomplete and preliminary in nature. (3) We therefore recommend that monitoring data be obtained regarding the levels of 2,4,5-T and Silvex and TCDD in milk, and that additional data be gathered regarding the levels of these agents in the tissues of range animals and that information be obtained regarding the levels of these agents in edible aquatic organisms.. In these additional monitoring

studies special emphasis should be placed on TCDD levels rather than levels of 2,4,5-T and Silvex, per se.

In regard to the specific issues and questions posed by the Agency to the Panel regarding review of 2,4,5-T and Silvex, the Scientific Advisory Panel offers the following responses:

ISSUES ON TOXICOLOGY

Question 1. EPA has found that 2,4,5-T, Silvex, and TCDD are teratogens. Does the Panel agree?

RESPONSE: The Scientific Advisory Panel agrees with the Agency that 2,4,5-T, Silvex, and TCDD are teratogens.

Question 2. EPA has found that 2,4,5-T, Silvex, and/or TCDD are fetotoxins. Does the Scientific Advisory Panel agree?

RESPONSE: The Scientific Advisory Panel agrees with the Agency that 2,4,5-T, Silvex, and TCDD produce reproductive (fetotoxic) effects.

Question 3. EPA has determined that TCDD exhibits fetotoxic effects and that a No Observable Effect Level (NOEL) has not been established for this effect. Does the Scientific Advisory Panel agree with this finding?

RESPONSE: The Panel agrees with the Agency that a NOEL has not been established for TCDD in chronic studies in monkeys. In contrast to the Agency position, the Panel concludes that a NOEL has been established for TCDD for both rats and mice. The Scientific Advisory Panel would like to point out in this regard that the Agency position is relatively close to that of the scientists from the Dow Chemical Company. The Scientific Advisory Panel believes that the dose of 0.001 ug/kg/day is for all practical purposes a NOEL (For the purposes of risk calculation; See Appendix I). It should be pointed out that a NOEL for reproductive effects has been established for commercial 2,4,5-T in all species tested including monkeys.

Question 4. EPA has found that TCDD is carcinogenic in test animals, and thus is a potential human carcinogen. Does the Scientific Advisory Panel concur with this finding?

RESPONSE: The Scientific Advisory Panel agrees with the Agency opinion that TCDD is carcinogenic in test animals and therefore may be a potential human carcinogen.

Question 5. EPA has found that TCDD is an extremely potent animal carcinogen. Does the Scientific Advisory Panel agree with this finding?

RESPONSE: Answered in question 4 above.

ISSUES ON EXPOSURE

Question 1. EPA believes that human exposure from the use of 2,4,5-T and Silvex on rice may be broad and substantial due to herbicide drift during and after application, and that more diffuse exposure is possible through the water environment and through crayfish, catfish and other food sources. How would the Panel characterize the exposure potentials and concerns for rice use? What questions do they have and how would they be answered by the proposed monitoring plan?

RESPONSE: The Scientific Advisory Panel agrees that exposure to 2,4,5-T and Silvex from use on rice may be possible through the water environment and through edible aquatic organisms and other food sources. However, the Scientific Advisory Panel believes that insufficient data was presented or made available to the Panel in support of the argument that human exposure from spray drift and the water environment is likely to be broad or substantial. The questions regarding proposed monitoring have already been addressed. In addition to the need for more data on the concentrations of Silvex, 2,4,5-T, and TCDD in crayfish and catfish, monitoring data should also be obtained on soil sediments.

Question 2. EPA believes that drift from the use of 2,4,5-T/silvex products on rangeland creates a lower, yet-still-real, potential for exposure due to lower population densities

and distribution in range areas relative to rice growing areas. Sparsity of surface water and extreme depth of ground water in many areas would suggest a minimal exposure from aquatic sources used as food. However, beef monitoring shows low levels of dioxin in a limited number of samples from beef that grazed on 2,4,5-T treated range. How would the Panel characterize the exposure potential and concerns for the use of these chemicals on range? What unanswered questions do they believe the Agency should address in determining exposure potential?

RESPONSE: The Scientific Advisory Panel agrees with the Agency that there is a potential for exposure as a result of drift from the use of 2,4,5-T and Silvex products on rangeland and that the potential for exposure from this mechanism would be lower than that from use of the agents on rice. However, the Panel believes that the data made available to the Panel did not provide a convincing argument for the existence of an immediate or substantial hazard from the use of Silvex and 2,4,5-T on rangelands.

Question 3. Little is known about the potential for dietary exposure to Silvex and/or TCDD from the uses of Silvex on food crops, except for apples on which Silvex residues have been detected. Given the nature of the contaminant TCDD, EPA has reason for presuming that exposure to food consumers and the environment is possible from these uses. What are the Panel's views on the potential for ingestion exposure from these uses?

RESPONSE: Although there is information on the use patterns of Silvex in orchard crops, the Scientific Advisory Panel believes sufficient residue data is not currently available for a definitive opinion on dietary exposure to Silvex.

Question 4. The Agency believes that TCDD and 2,4,5-T move in water from rice to other environmental compartments thereby increasing exposure to widely diffuse populations. Does the Scientific Advisory Panel concur with this?

RESPONSE: The Panel agrees with the Agency that it would be possible for 2,4,5-T to move in water from rice fields to other environmental compartments and to thereby increase exposure to widely diffuse populations. However, we believe such movement would be unlikely for TCDD.

GENERAL ISSUES

Question 1. Do the residues (2,4,5-T, Silvex and TCDD) in water, sediment, aquatic organisms and/or the potential for exposure from herbicide drift, in light of the toxicological attributes of these compounds, suggest to the Scientific Advisory Panel the possibility of significant risk?

RESPONSE: No. (See recommendation (1).)

Question 2. Can the Scientific Advisory Panel assess whether the residues being found in the rice areas are due to the rice use or to other previously permitted uses?

RESPONSE: The Panel is not aware of data sufficient to answer this question (See recommendation (3).)

Question 3. Do the exposure potentials in range use, in light of the toxicological characteristics of these compounds, suggest to the Scientific Advisory Panel the possibility of significant risk?

RESPONSE: No. (However, see recommendation (3).)

In consideration of the potential toxicity of TCDD, (4) the Scientific Advisory Panel recommends that efforts should be made to further reduce the level of chemical TCDD in commercial preparations of 2,4,5-T and Silvex.

FOR THE CHAIRMAN:

Certified as an accurate report of findings:

H. Wade Fowler Jr.

H. Wade Fowler, Jr., Ph.D.
Executive Secretary
FIFRA Scientific Advisory Panel

Date: September 26, 1979

APPENDIX I

THE FIFRA SCIENTIFIC ADVISORY PANEL EVALUATION OF THE ONCOGENICITY, FETOTOXITY AND EXPOSURE CHARACTERISTICS FOR 2,4,5-T, SILVEX AND TCDD

Introduction

In our opinion the major health and environmental issues relative to possible regulatory action by the Agency center around the potential of commercial forms of 2,4,5-T and Silvex contaminated with TCDD to pose carcinogenic, teratogenic and reproductive risks to persons as a result of (1) exposure during mixing and application, or (2) direct exposure to the spray as a result of living in the immediate area of application. In contrast, the major concern relative to TCDD, essentially free of 2,4,5-T or Silvex, arises from the degree to which this agent concentrates in portions of the human food chain. The primary concern of the Scientific Advisory Panel is the potential carcinogenic, reproductive, and teratogenic risk from use of commercial 2,4,5-T and Silvex contaminated with TCDD. The potential for these same risks from TCDD essentially free of 2,4,5-T and Silvex is of secondary concern, as is the potential risk posed by 2,4,5-T or silvex essentially free of TCDD.

Commerical 2,4,5-T

Oncogenicity

Seven studies of variable quality have been carried out in mice to examine the oncogenicity of commercial 2,4,5-T contaminated with TCDD.

The results of these studies have not demonstrated a carcinogenic risk from commercial 2,4,5-T in this rodent species. A complete study of the carcinogenic potential of commercial 2,4,5-T contaminated with TCDD at $\leq$ 0.05 ppm has not yet been reported in rats. However, such a study has recently been completed by the Laboratorium for Pharmakologie und Toxikologie, Hamburg, Germany. The Scientific Advisory Panel was informed during the recent meeting that gross autopsy examination of these animals revealed no increase in tumors relative to the control groups. However, until the pathological examination is complete no definitive conclusion can be drawn relative to the oncogenic potential of commercial 2,4,5-T in rats. The Dow Chemical Company has recently completed a study of the oncogenicity of a specially purified sample of 2,4,5-T in rats. This sample of 2,4,5-T contained less than 0.0003 ppm TCDD. In this study there was no increase in tumors resulting from exposure to this purified preparation of 2,4,5-T fed at the maximum tolerated dose (30 mg/kg/day) or at lower doses (10 mg/kg/day and 3 mg/kg/day). Thus it appears that 2,4,5-T, which is essentially free of contaminating TCDD, is not oncogenic in rats. However, this study is of limited predictive value since the form of 2,4,5-T of concern to the Scientific Advisory Panel is commercial 2,4,5-T; in other words, 2,4,5-T contaminated with TCDD.

Chronic tests carried out using TCDD free of 2,4,5-T have demonstrated that TCDD is carcinogenic in rats and carcinogenic or tumorigenic in mice. Thus, since commercial 2,4,5-T contains TCDD as a contaminant ($\leq$ 0.05 ppm)

the lack of a carcinogenic response in rodents using commercial 2,4,5-T must be viewed with caution. The Scientific Advisory Panel is of the opinion that some carcinogenic risk to man is posed by exposure to 2,4,5-T contaminated with TCDD at the level present in the 2,4,5-T in current use. However, the data currently available indicate that this risk is not substantial.

In summary, the evidence currently available indicates there is not an immediate or substantial oncogenic risk to man from exposure to 2,4,5-T contaminated with TCDD at a level of $\leq$ 0.05 ppm.

Reproductive and Embryo Toxicity

Commercial 2,4,5-T produces fetal toxicity and is teratogenic in rats and mice. According to the data presented to the Scientific Advisory Panel during the August 15-16, 1979 meeting, the no effect level for embryo toxicity for commercial 2,4,5-T in various species when examined in conventional toxicity studies is as follows: rat, 25 mg/kg/day; mouse, 20 mg/kg/day; hamster, 40 mg/kg/day; and monkey, 40 mg/kg/day. However, a recent study conducted at the National Center for Toxicological Research revealed teratogenic effects in A/J mice at the lowest dose of commercial 2,4,5-T tested (15 mg/kg/day). It would appear, therefore, that there are strain differences in the no effect level for 2,4,5-T in mice.

Two three-generation studies of 2,4,5-T reproductive toxicity have been carried out in rats. One of these studies was carried out using commercial 2,4,5-T containing $\leq$ 0.05 ppm TCDD. No teratogenic effects, reproductive toxicity or fetal toxicity were observed

in any animals at the doses tested (3, 10 and 30 mg/kg/day). In contrast another three-generation study carried out using purified 2,4,5-T ($\leq$0.0003 ppm TCDD) reported a significant decrease in neonatal survival at 10 and 30 mg/kg/day but not at 3 mg/kg/day. However some effects suggestive of reproductive toxicity were noted at the intake level of 3 mg/kg/day in this study. The Scientific Advisory Panel believes that this three-generation study establishes for practical purposes a NOEL and recommends that this NOEL be used for subsequent evaluation of risk.

In summary, the Scientific Advisory Panel believes that these data suggest that a potential for reproductive risk and embryo toxicity exists for persons engaged in the mixing and application of commercial 2,4,5-T. However with use of protective clothing such as a one piece jump suit with long sleeves, gloves and, perhaps, respirators, risks should be reduced to an acceptable level. The potential for significant reproductive and teratogenic risk to persons living in the immediate area of the spraying operations does not appear to be substantial except as they may be directly exposed on a chronic basis.

The Panel has some reservations relative to the validity of the three-generation study in rats carried out by the Laboratory fur Pharmakologie and Toxikologie using commercial 2,4,5-T ($\leq$ 0.05 ppm TCDD), and recommends that an additional three-generation study in rats using commercial 2,4,5-T be carried out.

Silvex

Oncogenicity

The carcinogenic testing of commercial Silvex has been less extensive than with 2,4,5-T. However, those few studies which have been carried out did not indicate an increase in oncogenicity as a result of chronic exposure to Silvex. Although no carcinogenic risk has been demonstrated with commercial Silvex, these data must be viewed with some caution because of the contamination of commercial Silvex with TCDD.

Reproductive and Embryo Toxicity

In contrast to commercial 2,4,5-T, very few studies of the reproductive toxicity of Silvex have been carried out. Those studies with commercial Silvex that have been carried out in rats and mice indicate that commercial Silvex is teratogenic in mice at high doses (400 mg/kg/day). Silvex is also fetotoxic in mice and rats and the no effect level in rats is 25 mg/kg/day.

Thus commercial Silvex does appear to pose some risks to reproduction and fetal viability. Much less information is available concerning the degree of exposure of humans to Silvex during mixing and spraying operations than is the case with 2,4,5-T. However, it should also be possible using proper protective clothing to reduce the reproductive and teratogenic risk from commercial Silvex to an acceptable level. Similarly there does not appear to be any

substantial risk to persons living in the immediate area of the spraying except from direct exposure on a chronic basis.

TCDD

Oncogenicity

Two major studies of the oncogenicity of TCDD have been reported. One study in rats has been carried out by the Dow Chemical Company and another in mice was performed by the Research Institute of Oncopathology in Hungary. A third study in mice and rats has recently been completed by NCI, but the results of this study were not yet available.

There was an increase in tumors of the liver, lung and hard palates/nasal turbinates in the rats fed of 0.1 ug/kg/day of TCDD in the diet. At a dose of 0.01 ug/kg/day there was an increase in hyperplastic nodules in the livers of the female rats. The EPA Carcinogen Assessment Group (CAG) has concluded that this increase in hyperplastic nodules at the dose of 0.01 ug/kg/day indicates that TCDD is also carcinogenic at this dosage level. The Scientific Advisory Panel concludes that there is a tumorigenic response at 0.01 ug/kg/day but has reservations as to whether hyperplastic nodules are precursors, per se, to hepatocellular carcinoma. (See Appendix II)

An increased incidence of liver tumors were produced in studies in male outbred Swiss mice in which TCDD was given by gavage at a dose of 0.7 ug/kg/week for one year. However, in this study there was no significant increase in tumor formation in animals given TCDD at 7.0 ug/kg/day although there was a decreased life span in the mice receiving this dose. There was also no increase in tumors in animals given TCDD at a dose of 0.007 ug/kg/week. Evaluation of this study by the Scientific Advisory Panel is difficult, since the type of liver tumor produced was not identified. Although the authors stated that the ratio of benign hepatomas to hepatocellular carcinomas was the same in the animals receiving the 0.7 ug/kg/week dose of TCDD as in the controls, it is not clear whether there was a significant increase in hepatocellular carcinomas in the treated animals.

The Scientific Advisory Panel concludes that there is a level of TCDD below which no oncogenic or tumorigenic effects were seen in either mice or rats. The dose level for tumorigenic response in the outbred strain of Swiss mice used in the Hungarian oncogenic study lies between 0.007 and 0.7 ug/kg/week. The Scientific Advisory Panel believes that the data available from this study are insufficient to reach a firm conclusion regarding whether there was a true oncogenic response in mice. In rats there was some controversy over which level of exposure to TCDD demonstrated an oncogenic effect. The Dow Chemical Company scientists stated that the level at which no oncogenic effects are seen lies between a dose of 0.1

and 0.01 ug/kg/day in the diet. The EPA Carcinogen Assessment Group concluded that the non-oncogenic dose lies between 0.01 and 0.001 ug/kg/day. Thus, there was agreement concerning the lack of an oncogenic response at the dose level of 0.001 ug/kg/day TCDD.

The major concern of the Scientific Advisory Panel relative to the potential oncogenic risk from TCDD is whether TCDD accumulates in the human food chain. The data necessary to evaluate this risk must be derived from monitoring data for TCDD itself. The oncogenic risk from TCDD present as a contaminant in commercial 2,4,5-T and Silvex is best determined in those experiments in which commercial 2,4,5-T or Silvex contaminated with TCDD has been administered chronically to rats and mice.

The monitoring data obtained thus far does not suggest that TCDD derived from commercial 2,4,5-T and Silvex exhibits any tendency to accumulate in the human food chain in amounts which would pose a substantial risk. For example TCDD has been detected in some fat samples from cows grazed on rangeland immediately after spraying with commercial 2,4,5-T and sacrificed 2 weeks later. If one assumes that all beef fat in the U.S. contains TCDD at the level found in these studies (approximately 10 ppt) and if one assumes further that the average level of beef intake in the U.S. population is 6% of the diet; (1.5 kg food/day; 15% of beef is fat) and produces a 22% incidence of tumors at 0.1 ug/kg/day (Dow Study) a risk of 4×10^{-6} can be calculated. It should be pointed out that this is an extreme worse case calculation since the

present data indicate that only a small percent (approximately 7%) of beef fat samples from animals fed on ranges immediately after spraying with 2,4,5-T containing TCDD and that all beef eaten in the U.S. does not come from ranges sprayed with 2,4,5-T (only 2%). Thus, although it appears that there is some potential oncogenic risk from TCDD present in the food chain, on the basis of the current monitoring data, the risk is judged to be small.

Reproductive Toxicity

The results of the embryo toxicity studies indicate that the no effect level for TCDD in mice is 0.1 ug/kg/day (days 6-15 of gestation), in rats is 0.03 ug/kg/day (days 6-15 of gestation), and in monkeys is 0.02 ug/kg/3 times per week (days 20-40 of gestation).

In a three-generation reproductive study carried out in rats by the Dow Chemical Company clear cut embryo toxicity was seen at doses of 0.1 and 0.01 ug/kg/day of TCDD. At the dose of 0.001 ug/kg/day there was a decreased gestational survival in the F_2 generation but not in earlier or later generations. Postnatal survival in the group receiving 0.001 ug/kg/day was decreased in the F_{1a} generation and increased in the F_{1b} generation relative to the controls. An increase in dilated renal pelvis was also seen in the F_{1a} and F_{1b} generation in the animals receiving 0.001 ug/kg/day but not in later generations or at the 0.01 ug/kg/day dose. Although these effects at 0.001 ug/kg/day are suggestive of an embryo-toxic effect, the inconsistency of the effects from generation to generation and in relation

to the higher dose of 0.01 ug/kg/day (dilated renal pelvis) suggests that the 0.001 ug/kg/day dose is for all practical purposes a no effect level.

Long term studies in monkeys have shown reproductive toxicity from TCDD at levels of 50 ppt in the diet. Studies are currently underway at 25 ppt of TCDD in the diet, but results are not yet available. An intake of TCDD of 50 ppt in the diet is equivalent to approximately 0.002 ug/kg/day. If no reproductive toxicity is seen in the monkeys exposed to TCDD in the diet at 25 ppt, then the no effect level in the monkey will be similar to that seen in the rat, namely about 0.001 ug/kg/day.

The major concern of the Scientific Advisory Panel relative to the potential reproductive toxicity or teratogenic effects of TCDD is whether it accumulates in human food chains as previously noted for the oncogenic potential of TCDD. The reproductive toxicity and teratogenic potential of TCDD present as a contaminant in commercial 2,4,5-T and Silvex is best determined from experiments in animals exposed to commercial 2,4,5-T or Silvex contaminated with TCDD.

If one assumes the worse case situation described previously in the evaluation of the oncogenic risk from TCDD in which TCDD is proposed to be present in the fat of all cows marketed in the U.S., the maximum intake would be approximately 2×10^{-6} ug/kg/day. Using a 0.001 ug/kg/day as the no effect level the safety factor would be approximately 500. As pointed out previously in the section on the oncogenicity of TCDD, this calculation represents an extreme exaggeration of exposure to TCDD. The Scientific Advisory Panel believes, therefore,

that the current monitoring data do not indicate that there is a substantial reproductive or teratogenic risk posed by the accumulation of TCDD in the human food chain.

APPENDIX II

A Selected Review of the Histology of the Dow TCDD Study (Tox. Appl. Pharm. 46, 279 (1978))

Drs. Donna Kuroda, Richard Kociba and I reviewed 3 representative microscopical sections each from control, 0.01, and 0.1 ug/kg/day level TCDD exposed female Sprague Dawley rats. These sections were selected by Dr. Kociba to demonstrate hyperplastic nodules and lesions designated hepatocellular cancers (see Table #5 R.J. Kociba et al. Tox. & Appl. Pharm. 46, 279 (1978)). Control sections were used for comparison.

Control animals, selected from timed sacrifices, showed a general presentation of the liver architecture. A natural incidence (spontaneous?) of extramedullary hematopoiesis, bile duct reduplication, and "hyperplastic nodules" was found by Dr. Kociba (Table 5) and demonstrated in the sections provided to me. Kociba and collegues considered a tissue mass to represent a hyperplastic nodule if a group of liver cells, with or without sinusoidal lining cells, formed a discrete population with cellular structure and/or tinctorial properties different from the surrounding parenchyma. These growths may or may not cause compression of surrounding parenchyma and may or may not have bile duct formation. Sharp demarcation from the surrounding parenchyma was observed.

In addition, there were both acute inflammatory exudates and granuloma-like lesions in the controls, not associated with the hyperplastic nodule. In addition there appeared to be an acute cholangitis. No

evidence of fibrosis was present.

Sections from the high dose exposure animals (0.1 ug/kg/day) showed some distortion of the hepatic parenchyma with cellular variability and thickening of the liver cell plates. Portal tracts were sometimes associated with dense collections of lymphocytes. Prominent were hyperplastic nodules and lesions characterized by Kociba and associates as hepatocellular carcinomata. These latter lesions showed more marked cellular differences from surrounding parenchyma and from hyperplastic nodules. In general, the liver cell nuclei were larger occupying a greater portion of the cell volume, the cell plates more disordered, formation of acinar and tubular forms were identified, and no formation of portal tracts were present in these lesions. These masses in one instance, arose in a hyperplastic nodule. No defined microscopical or gross evidence of invasion of the neoplastic cells into adjacent tissues was noted either at autopsy (according to Kociba) or by microscopy. Not infrequently fat was present in hyperplastic nodules but not in the "carcinomata".

The parenchyma adjacent to the carcinomatans and hyperplastic nodules showed some cellular irregularity, staining variation, and hyaline intracytoplasmic masses. No significant evidence of increased inflammatory exudates or fibrosis was noted, but bile duct reduplication was present.

The midrange dose shows hyperplastic nodules, the remaining changes were identical with the high dose, but these slides did not show a carcinoma. I believe that the group at Dow extensively and properly surveyed the evidence of hepatocellular disease following exposure of rats to TCDD. Autopsies on animals were conducted by pathologists and tissue sections were selected by them. Their microsopial review was extensive. Their nomenclature was defined and understandable. I personally would have been more conservative than they in designating carcinomata, so their result is a "worst case" designation. From these discussions and reviews, I am very comfortable with their evaluation for toxic injury and carcinogenesis. Additionally, I believe liver cancer was shown in the high dose level; might be questioned in the midrange level, but was not present in the low dose group.

Edward Smuckler, M.D., Ph.D.
Professor and Chairman
Department of Pathology
University of California
School of Medicine
San Francisco, California

August 15, 1979
Survey conducted at EPA Headquarters
401 M Street, S.W.
Washington, D.C. 20460

APPENDIX C

DEPARTMENT OF AGRICULTURE
OFFICE OF THE SECRETARY
WASHINGTON, D.C. 20250

August 10, 1979

RECEIVED
AUG 13 1979
TS-766 OSPRD

RECEIVED
AUG 10 1979
Deputy Assistant Administrator
for Office of Pesticide Programs

Mr. Edwin L. Johnson, (TS-766)
Deputy Assistant Administrator for
Pesticide Programs
U.S. Environmental Protection Agency
Washington, D.C., 20460

Dear Ed:

The Secretary has asked me to respond to your letter of July 9, 1979, regarding the proposal to hold hearings under Section 6(b)(2) of the Federal Insecticide, Fungicide, and Rodenticide Act, 7 U.S.C. 136d(b)(2) to determine whether or not the nonsuspended uses of 2,4,5-T and silvex should be cancelled.

As you know, the Secretary is a party in the Section 6(b)(1) hearing. Except for slightly different use patterns and exposure considerations, the issues on both the suspended and nonsuspended uses are similar and we, therefore, plan to participate in the 6(b)(2) portion as well.

Contrary to statements in the Notice of Intent to hold a hearing on the remaining uses of silvex, the Department of Agriculture has not provided information on the "social, economic, and environmental benefits" of using silvex to you. This information is currently being collected by the joint USDA/States/EPA assessment team, but since an RPAR notice was not issued on this compound, the team, which was organized recently, has only had time to develop some preliminary data.

We agree that it is in the best interest of everyone to attempt to resolve all issues in a consolidated hearing. We are preparing to have information available on all uses of both 2,4,5-T and silvex for presentation to the Administrative Law Judge during these proceedings.

We will be submitting for the record of the hearings the benefit and exposure information contained in the 2,4,5-T assessment report prepared by the joint USDA/States/EPA assessment team as well as information presently being gathered by the joint assessment team on silvex. We believe that the assessment team activity has been an effective means for assembling information needed in the regulatory decision process.

Your notice indicates that additional data on the benefits of the nonsuspended uses of 2,4,5-T will be needed before a final regulatory decision can be made. It would be most helpful to us and to the process if you would point out specifically where the data in the USDA/States/EPA

report "The Biologic Economic Assessment of 2,4,5-T" is not adequate. We are anxious to cooperate with you in filling any data gaps that may exist to assure that all possible information can be examined in reaching a final decision.

Sincerely,

Barry R. Flamm

BARRY R. FLAMM
Director
Office of Environmental Quality